BrightFields, Inc.

Appendix 12

ELECTRIC HOSE AND RUBBER
WILMINGTON, DELAWARE

SIRB ID: DE-0174

BrightFields, Inc.

GENERAL SITE INFORMATION

Site Name: Electric Hose and Rubber

SIRB ID Number: DE-0174

Site Location and Description: Electric Hose and Rubber site (The Brandywine Industrial Complex parcel) is located at 1318 E. 12th Street in Wilmington, Delaware. The site consists of an approximate 11.3 acre parcel. Existing improvements on the site include an approximately 350,000 square foot building. The building is primarily used for warehouse space and occupies most of the parcel, with the exception of the courtyard (shown in the center of Figure 1) which is used as a parking lot. Surrounding land use includes commercial, and/or industrial. The Gander Hill Prison and baseball field are on the opposite side of 12th Street and are northeast of the site. The Amtrak rail yard (Former Refueling Facility) is also on the northeast side of 12th street. Reportedly, the Amtrak yard has had releases of diesel fuel and Polychlorinated Biphenyls (PCBs), which have impacted the area groundwater. The Shellpot Creek emanates from the northeast side of 12th Street and drains to the Brandywine Creek via a storm water culvert· south of 12th Street. The Brandywine Creek runs along the full length (approximately 1,400 feet) of the southwest side of the property. A "sea wall" is along the edge of the creek and defines the southwest side of the property.

Previous Site Uses: The Electric Hose and Rubber company operated on this site from the early 1900s and ceased operations in the 1970s. During this time period the company manufactured wire and high pressure textile hosing. After the company ceased operations the warehouse was converted to small offices and leased out by the Wilmington Development Corporation. Currently the property is still being maintained as a warehouse storage facility.

Site Regulatory Status: This section briefly summarizes previous investigations performed on the site through the SIRB program. A current SIRB regulatory status is also included.

Preliminary Assessment of Electric Hose and Rubber (DNREC 1988)

DNREC conducted a non-sampling assessment of the Electric Hose and Rubber facility in 1988. The assessment determined that the site should be investigated further, but was considered at the time a "medium-priority" site.

Brownfield Preliminary Assessment II (BPA II) of the Diamond State Foundry Study Area (DNREC 200)

Soil and sediment sampling took place the week of June 14, 1999 and sampling of one monitoring well occurred on July 7, 1999. DNREC collected a total of 71 soil and sediment samples during the BPA II, which included both shallow and deep soil media. During this investigation DNREC collected 15 soil samples on the Electric Hose and Rubber property.

The investigation determined that there were areas of concern associated with the old transformer area on the Electric Hose and Rubber site and extremely elevated PAHs and metals were reported south and east of the Amtrak line. DNREC concluded that the owners of Diamond State Foundry/Pullman Carworks should enter into a Voluntary Cleanup Program (VCP) to further assess the site and potential exposure pathways for the community. In addition, DNREC recommended that the Electric Hose and Rubber Site enter into a VCP to further investigate the elevated concentrations of lead and PCBs in the area of transformers and to further assess the soil beneath the structures on the property.

Current Regulatory Status:

On April 11, 2002 Gilmore Associates, Inc. submitted a work plan for additional sampling activities on the Electric Hose and Rubber site (Brandywine Industrial Complex parcel). In addition, the work plan addressed the possibility of a remedial action at the transformer area. As of December 2008 no work associated with this work plan has been completed.

SUMMARY OF SITE PCB INFORMATION

Site Investigation PCB Findings:

PCBs (Aroclor-1254 and Aroclor-1260) were detected in six surface soil samples at concentrations ranging from 0.24 mg/kg to 1,970 mg/kg. There were no reported concentrations of PCBs in the subsurface non-saturated soils or subsurface saturated soils.

Due to the large spatial extent of the site, individual areas were assessed rather than comparing the site as a whole. This was done to evaluate the different overland flow pathways and different types of surface cover management. Maximum concentrations observed within the individual areas were used in the overland flow calculations.

Two distinct areas were identified in the overland mass loading evaluation; the area in the vicinity of SS-2, the southern section of the property, and the area in the vicinity of SS-4, the northern section of the property adjacent to 12th Street (Figure 5).

Concentrations of PCBs on Site			
Sample Matrix	**Corresponding Figure**	**Analytical Methods**	**Range of Total PCBs**
Surface Soil	Figure 2	Method 8082 and Immunoassay	Not detected to 1,970 mg/kg
Subsurface Soil (unsaturated)	Figure 3	Immunoassay	Not detected
Subsurface Soil (saturated)	Figure 4	Method 8082 and Immunoassay	Not detected
Groundwater	Not Applicable	Not Applicable	Not Applicable

A summary of all samples collected for PCBs are presented in the attached Tables 1 through 2.

Acreage where PCBs detected:

The total area associated with surface soil impacted by PCBs is estimated at 1.12 acres, of which only 0.06 acres may still be contributing to overland flow loading. The remainder of surface soil impacted by PCBs is under an impervious surface. No subsurface unsaturated soil or subsurface saturated soil appear to have been affected by PCBs on this site.

PCB Remediation Status:

As of December 2008 no remedial actions have been completed. A work plan outlining an additional investigation and remedial actions associated with the PCB contaminated areas was drafted in 2002, but no work has been completed.

PCB MASS LOADING SUMMARY

The PCB mass loading rate to surface water via overland flow is discussed below. There were no reported concentrations of PCBs in the subsurface saturated zone or in the groundwater; therefore, groundwater transport is not considered a mechanism of transport for PCBs at the Electric Hose and Rubber Site. A summary of the results is included below and the details of the calculations are included as attachments to this Appendix.

OVERLAND FLOW:

Overland flow has been determined on this site by using the Revised Universal Soil Loss Equation (RUSLE). The RUSLE predicts the long term average annual rate of erosion on an area based on rainfall patterns, soil type, topography, cover/canopy factors and support management practices. These specific factors are site specific and rely on local information of the site. A breakdown of the individual factors is presented below with a brief explanation of their choice.

Ground Cover and Canopy:

A site inspection was performed on November 7, 2008 to estimate the current site ground cover and canopy. Due to the size of the site and the different cover systems, BrightFields identified two separate areas of concern. The cover/management factor (C) assigned to the site and associated flow path is 0.068 to 0.08, which corresponds to areas that currently have a vegetative cover consisting of 75% groundcover of tall weeds or short brush, with cover at surface composed of mostly broadleaf herbaceous plants or un-decayed residues or both. Photographs of the surface cover are included in an attachment to this appendix.

Site Sediment and Erosion Control Practices:

There are currently no sediment and erosion controls in place at the Electric Hose and Rubber site.

Input Factors and Results:

A breakdown of the individual factors is presented below with a brief explanation of their choice.

Area 1: Northern Portion of the site adjacent to 12th Street

RUSLE Factors	Values Provided	Explanation of Selection
R = rainfall-runoff erosivity index (10^2 ft-tonf-in/ac-hr)	170	An appropriate value for R for the site was determined from plots of Rainfall patterns for the Eastern U.S. (Wischmeier and Smith, 1978).
K = soil erodibility (0.01 tonf acre hr/acre ft-ton in)	0.15	The soil erodibility factor was inferred based on the information provided by the boring log represented for TP-11 in the BPA II of Diamond State Foundry Study Area (DNREC 2000).
ls = topographic factor (dimensionless)	0.031	The slope length was estimated to 104 feet, which is the distance between the site and the closest storm water discharge location along the overland flow path. The assumed slope (0.01 %) and slope length were used to calculate a topographic factor of 0.031 from the USGS windows based application.
C = cover/management factor (dimensionless)	0.08	The cover/management factor C assigned to the site by the USGS windows based application was 0.08, which corresponds to approximately a 75% cover with tall weeds and short brush.
P = support practice factor (dimensionless)	1.0	There are currently no support practices instituted.

The average annual erosion rate is based on the windows based RUSLE2 program (RUSLE2 License, version 2006-Jul-24).

The total PCB loading via overland flow for Area 1 is 1.8 grams per year. Please see attached table for specific variables.

Area 2: Southern portion of the property adjacent to the River

RUSLE Factors	Values Provided	Explanation of Selection
R = rainfall-runoff erosivity index (10^2 ft-tonf-in/ac-hr)	170	An appropriate value for R for the site was determined from plots of Rainfall patterns for the Eastern U.S. (Wischmeier and Smith, 1978).
K = soil erodibility (0.01 tonf acre hr/acre ft-ton in)	0.15	The soil erodibility factor was inferred based on the information provided by the boring log represented for TP-11 in the BPA II of Diamond State Foundry Study Area (DNREC 2000).
ls = topographic factor (dimensionless)	1.00	The slope length was estimated to 17 feet, which is the distance between the site and river along the overland flow path. The assumed slope (8.24 %) and slope length were used to calculate a topographic factor of 1.00 from the USGS windows based

		application.
RUSLE Factors	**Values Provided**	**Explanation of Selection**
C = cover/management factor (dimensionless)	0.068	The cover/management factor C assigned to the site by the USGS windows based application was 0.068, which corresponds to approximately a 75% cover with tall weeds and short brush.
P = support practice factor (dimensionless)	1.0	There are currently no support practices instituted.

The average annual erosion rate is based on the windows based RUSLE2 program (RUSLE2 License, version 2006-Jul-24).

The total PCB loading via overland flow for Area 2 is 0.04 grams per year. Please see attached table for specific variables.

Uncertainty Analysis Associated with Overland Flow:

Specific Areas and Degree of Uncertainty for Electric Hose and Rubber

	Samples Per Acre (site)	Chemical Data Quality*	Topography	Soil Type	Site Coverage	Map Quality	Distance to Discharge Points
Site Specific Information	1.4	Immunoassay	Estimated based on a visual inspection	Based on logs that were located on-site	Based on a limited site assessment	Scaled Map; site boundaries were not clearly defined	104 feet 17 feet
Degree of Uncertainty	Moderate to High	High	High	Moderate	Moderate	Moderate to High	Low to Moderate

* Primary analysis used in the historical samples

Sources of uncertainty for the Electric Hose and Rubber site include the following: spot elevations in this area have been well documented, but due to the building occupying a large portion of the site, elevations had to be assumed in some cases. The soil type in this area was inferred based on soil characteristics from boring TP-11, which is in the vicinity. The slope in Area 1 was assumed to be 0.01 ft/ft. This was assumed because during the site inspection, BrightFields observed that the area was actually in a depression. During a worst case storm the area would then flood and transport sediment to a discharge point. Due to inaccessibility to the southern portion of the site adjacent to the river, BrightFields estimated the surface cover from observations made across the river and aerial photography. Based on these findings the overall uncertainty associated with the Electric Hose and Rubber site is **moderate to high.**

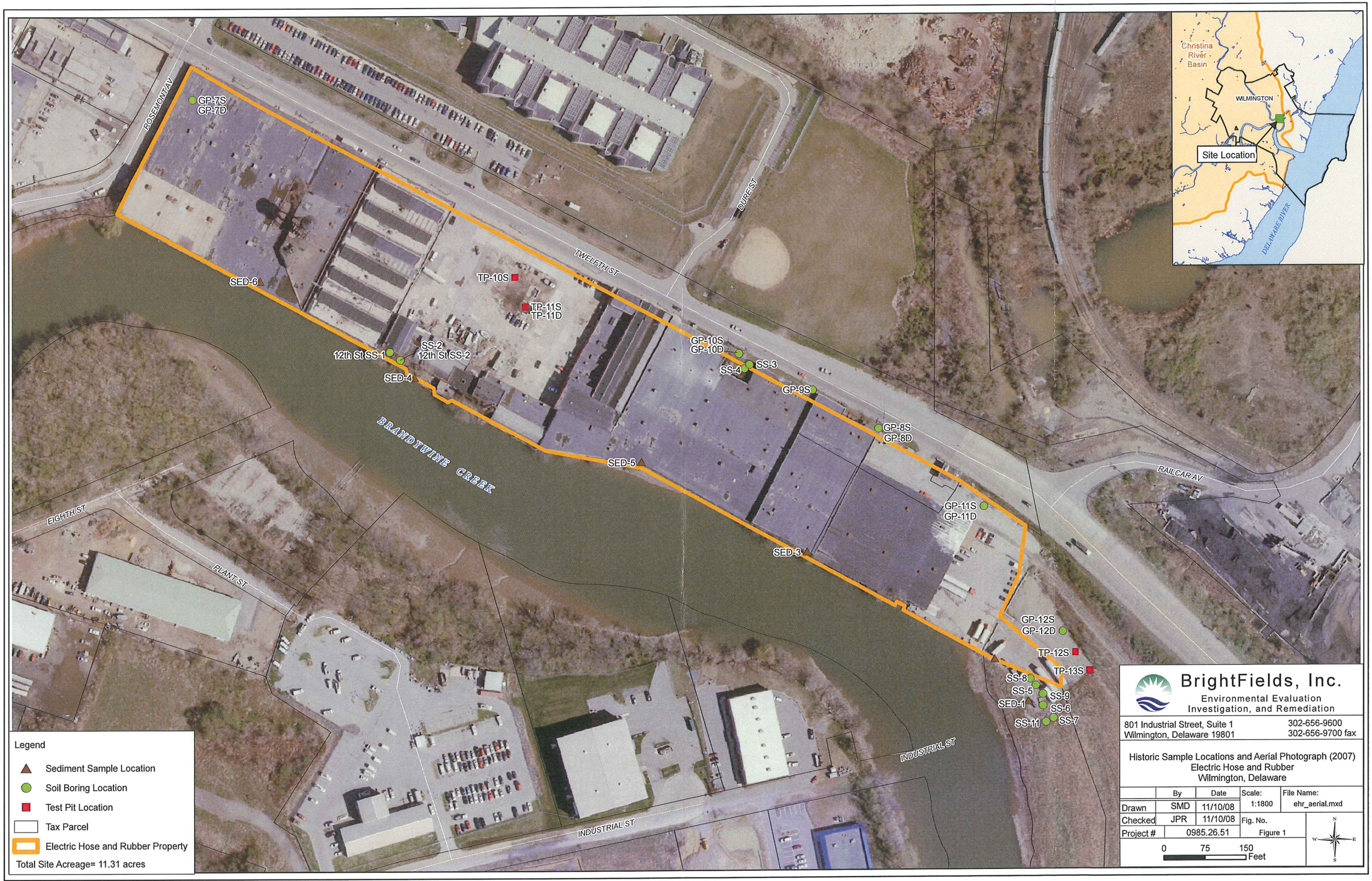
Site References:

Delaware Department of Natural Resources and Environmental Control (DNREC), 2000, Brownfield Preliminary Assessment II of the Diamond State Foundry Study Area. September 2000.

DNREC, 1988, Non-Sampling Assessment of Electric Hose and Rubber. 1988.

Gilmore & Associates, Inc., 2002, Voluntary Cleanup Program (VCP) Work Plan Brandywine Industrial Complex; A Portion of the Former Electric Hose and Rubber Facility. April 2002.

Figures



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Historic Sample Locations and Aerial Photograph (2007)
Electric Hose and Rubber
Wilmington, Delaware

	By	Date	Scale:	File Name:
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Checked	JPR	11/10/08	Fig. No.	
Project #	0985.26.51		Figure 1	

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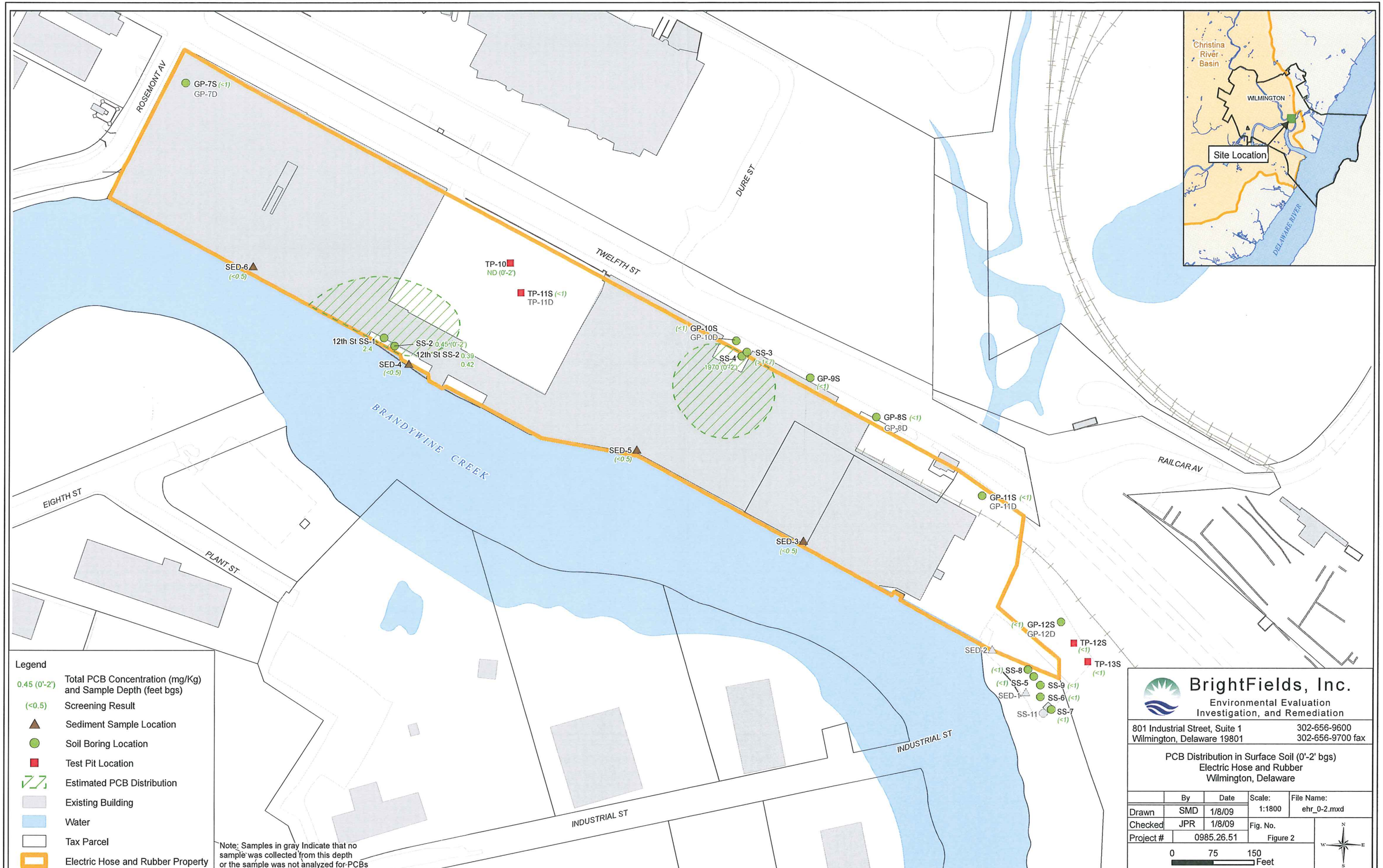

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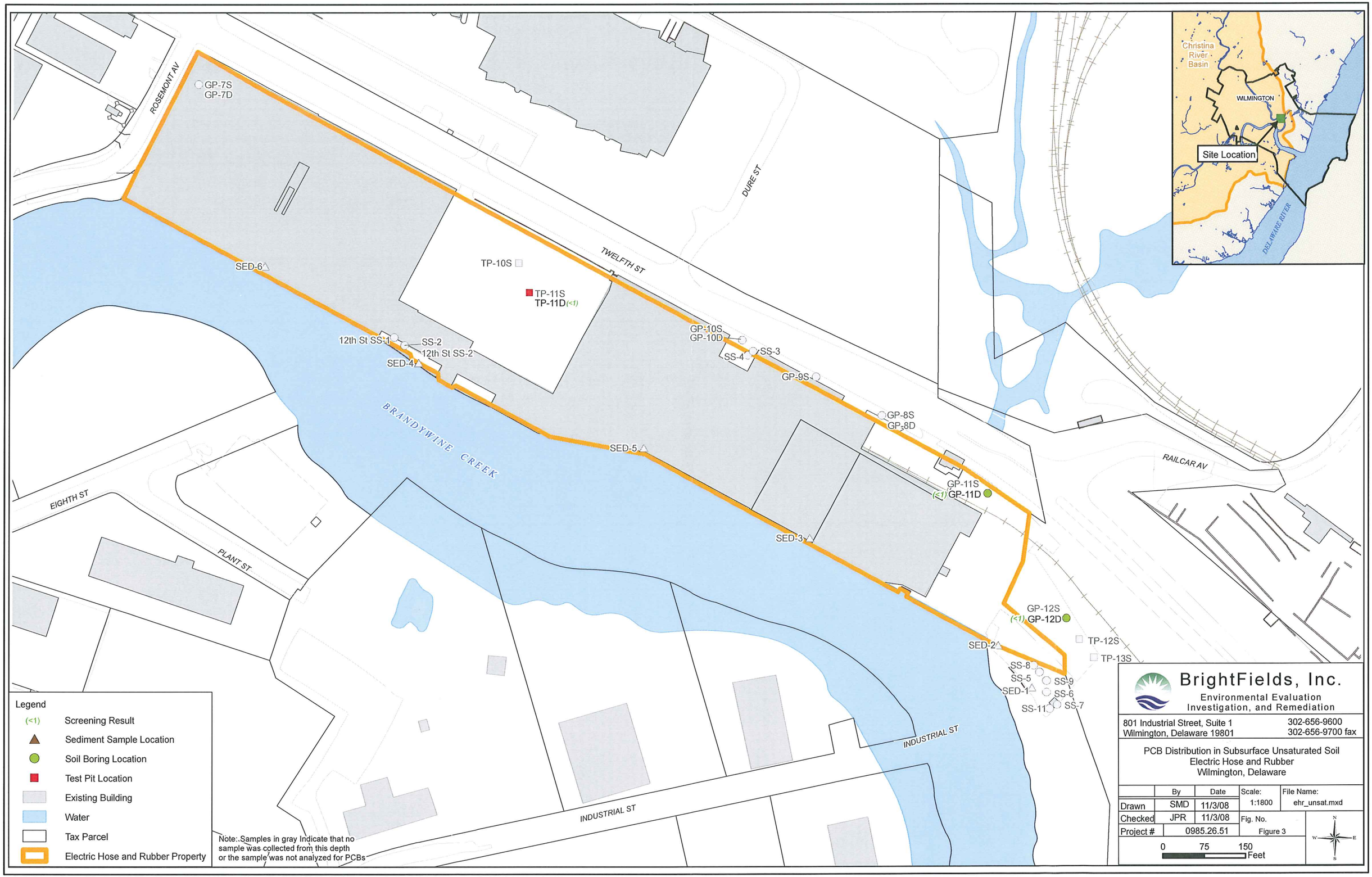

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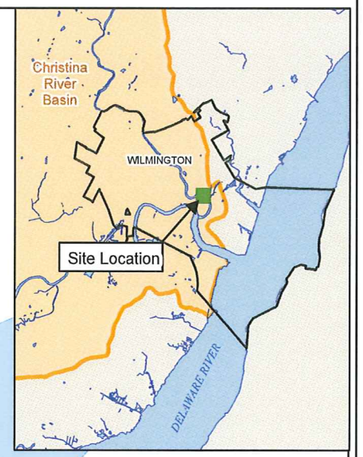
GP-7S
GP-7D ND (10')
ROSEMONT AV
DURE ST
TWELFTH ST
SED-6
TP-10S
TP-11S
TP-11D
12th St SS-1
SS-2
12th St SS-2
SED-4
GP-10S
(<1) GP-10D
SS-4
SS-3
GP-9S
GP-8S
GP-8D (<1)
BRANDYWINE CREEK
SED-5
RAILCAR AV
GP-11S
GP-11D
EIGHTH ST
PLANT ST
SED-3
GP-12S
GP-12D
TP-12S
TP-13S
SED-2
SS-8
SS-5
SS-9
SS-6
SED-1
SS-11
SS-7
INDUSTRIAL ST
INDUSTRIAL ST



Legend

ND (10')	PCBs Not Detected and Sample Depth (feet bgs)
(<1)	Screening Result
	Sediment Sample Location
	Soil Boring Location
	Test Pit Location
	Existing Building
	Water
	Tax Parcel
	Electric Hose and Rubber Property

Note: Samples in gray Indicate that no sample was collected from this depth or the sample was not analyzed for PCBs

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PCB Distribution in Subsurface Saturated Soil
Electric Hose and Rubber
Wilmington, Delaware

	By	Date	Scale:	File Name:
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Checked	JPR	1/8/09	Fig. No.	
Project #	0985.26.51		Figure 4	

0 75 150 Feet

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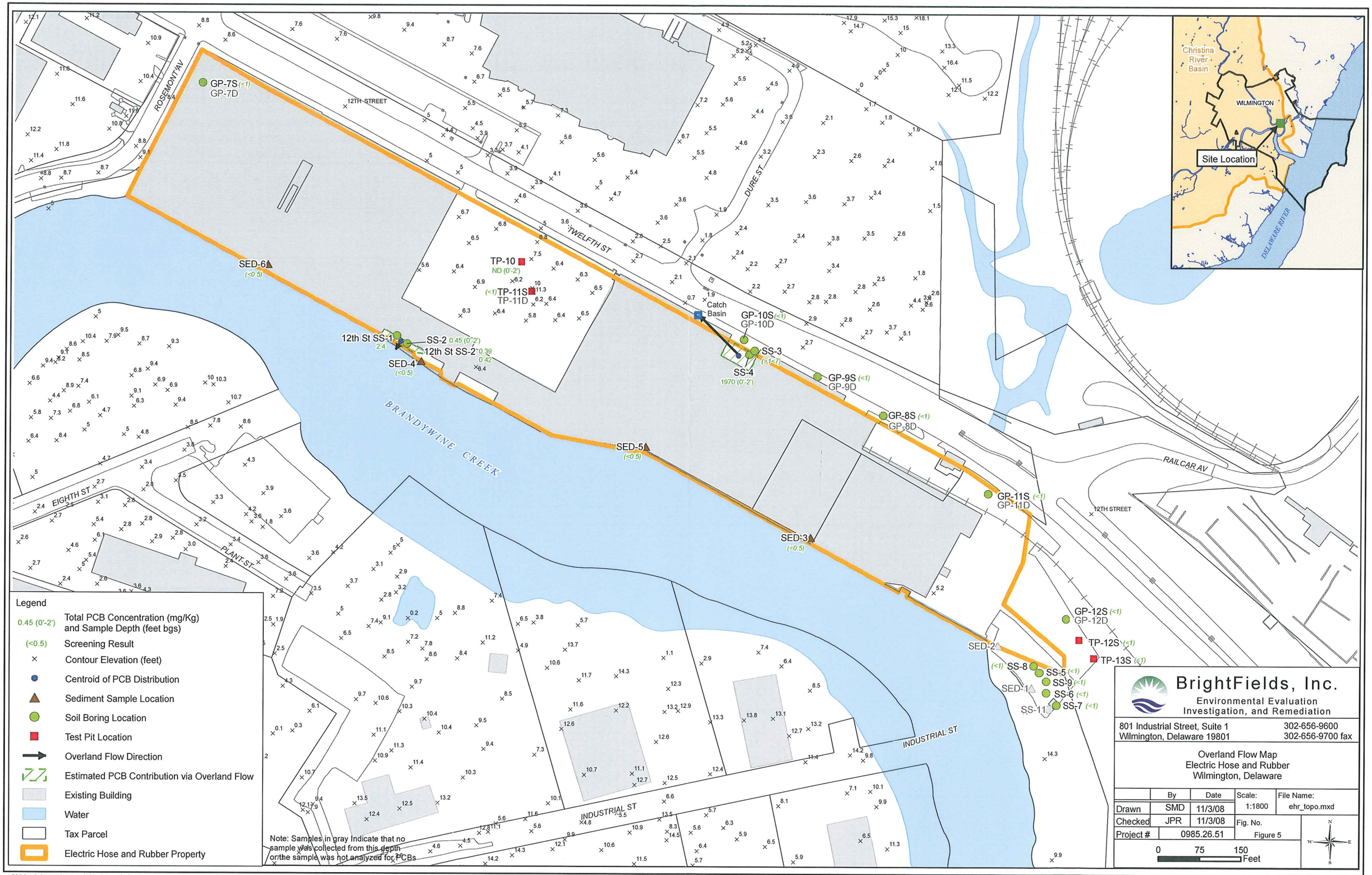

Legend

- 0.45 (0'-2') — Total PCB Concentration (mg/Kg) and Sample Depth (feet bgs)
- (<0.5) — Screening Result
- Contour Elevation (feet)
- Centroid of PCB Distribution
- Sediment Sample Location
- Soil Boring Location
- Test Pit Location
- Overland Flow Direction
- Estimated PCB Contribution via Overland Flow
- Existing Building
- Water
- Tax Parcel
- Electric Hose and Rubber Property

Note: Samples in gray Indicate that no sample was collected from this depth or the sample was not analyzed for PCBs

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Overland Flow Map
Electric Hose and Rubber
Wilmington, Delaware

	By	Date	Scale:	File Name:
Drawn	SMD	11/3/08	1:1800	ehr_topo.mxd
Checked	JPR	11/3/08	Fig. No.	
Project #	0985.26.51		Figure 5	

0 75 150 Feet

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Tables

Table 1
PCB Laboratory Analytical Results For Soil
Electric Hose and Rubber
Wilmington, DE
SIRB ID: DE-0174

Sample ID Sampling Depth (feet bgs) Sampling Date Units Report Issued	DNREC URS for Protection of Human Health Non-critical Water Resource Area mg/Kg		12th St SS-2 0"-6" 7/12/99 mg/Kg DNREC (2000)	12th St SS-1 0"-6" 7/12/99 mg/Kg DNREC (2000)	SS-4 0'-2' 6/14/99 mg/Kg DNREC (2000)	12th St SS-2 0"-6" 7/12/99 mg/Kg DNREC (2000)
	Unrestricted Use	Restricted Use				
PCBs						
Aroclor-1016	5	82	0.062 U	0.068 U	78 U	0.140 U
Aroclor-1221	0.3	3	0.062 U	0.068 U	160 U	0.140 U
Aroclor-1232	0.3	3	0.062 U	0.068 U	78 U	0.140 U
Aroclor-1242	0.3	3	0.062 U	0.068 U	78 U	0.140 U
Aroclor-1248	0.3	3	0.062 U	0.068 U	78 U	0.140 U
Aroclor-1254	0.3	3	0.062 U	0.068 U	**670**	0.140 U
Aroclor-1260	0.3	3	**0.39**	**2.4**	**1300**	**0.42**

DNREC (2000) - Brownfield Preliminary Assessment II for Diamond State Foundry Study Area (September 2000)

Qualifiers
U - The compound was not detected above the indicated laboratory detection limit
NR - Not analyzed
nca - no criteria available
bold - concentration is above DNREC URS unrestricted use criteria
shaded - concentration is above DNREC URS restricted use criteria

Table 1
PCB Laboratory Analytical Results For Soil
Electric Hose and Rubber
Wilmington, DE
SIRB ID: DE-0174

Sample ID Sampling Depth (feet bgs) Sampling Date Units Report Issued	DNREC URS for Protection of Human Health Non-critical Water Resource Area mg/Kg		SS-2 0'-2' 6/14/99 mg/Kg DNREC (2000)	TP-10S 0'-2' 6/14/99 mg/Kg DNREC (2000)	GP-7D 10' 6/14/99 mg/Kg DNREC (2000)
	Unrestricted Use	Restricted Use			
PCBs					
Aroclor-1016	5	82	0.047 U	0.038 U	0.41 U
Aroclor-1221	0.3	3	0.094 U	0.075 U	0.082 U
Aroclor-1232	0.3	3	0.047 U	0.038 U	0.041 U
Aroclor-1242	0.3	3	0.047 U	0.038 U	0.041 U
Aroclor-1248	0.3	3	0.047 U	0.038 U	0.041 U
Aroclor-1254	0.3	3	0.24	0.038 U	0.041 U
Aroclor-1260	0.3	3	0.21	0.038 U	0.041 U

DNREC (2000) - Brownfield Preliminary Assessment II for Diamond State Foundry Study Area (September 2000)

Qualifiers
U - The compound was not detected above the indicated laboratory detection limit
NR - Not analyzed
nca - no criteria available
bold - concentration is above DNREC URS unrestricted use criteria
shaded - concentration is above DNREC URS restricted use criteria

Table 2
DNREC PCB Screening Data
Electric Hose and Rubber
Wilmington, DE
SIRB ID: DE-0174

Sample ID	Sample Depth	Investigation Report	Sample Date	DNREC URS for Protection of Human Health (Non-critical Water Resource Area) Unrestricted Use (mg/kg)	Total PCBs (mg/kg)
GP-7S	0'-2'	DNREC (2000)	6/14-16/99	1	<1
TP-11D	4'	DNREC (2000)	6/14-16/99	1	<1
GP-8S	0'-2'	DNREC (2000)	6/14-16/99	1	<1
GP-10S	0'-2'	DNREC (2000)	6/14-16/99	1	<1
SS-3	0"-6"	DNREC (2000)	6/14-16/99	1	**>1 <7**
TP-11S	0'-2'	DNREC (2000)	6/14-16/99	1	<1
GP-10D	>2'	DNREC (2000)	6/14-16/99	1	<1
GP-8D	6'	DNREC (2000)	6/14-16/99	1	<1
GP-9S	0'-2'	DNREC (2000)	6/14-16/99	1	<1

DNREC (2000) - Brownfield Preliminary Assessment II for Diamond State Foundry-Pullman Car Works (September 2000)

Qualifiers:
ND - compound was not detected
Bold - concentration exceeds URS
nca - no criteria available

Site Photographs

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PCB Mass Loading Evaluation
Electric Hose and Rubber

Courtyard consisting of deteriorated concrete slabs and stone.

Former transformer area identified as an area of concern.

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PCB Mass Loading Evaluation
Electric Hose and Rubber

Drainage ditch associated with the former transformer area.
The slope of the ditch is toward the transformer area.

Drainage ditch parallel to 12th Street leading into the former transformer area.

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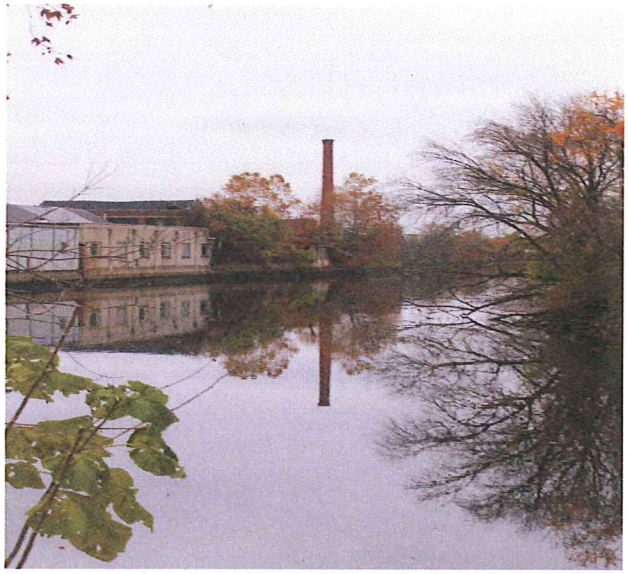
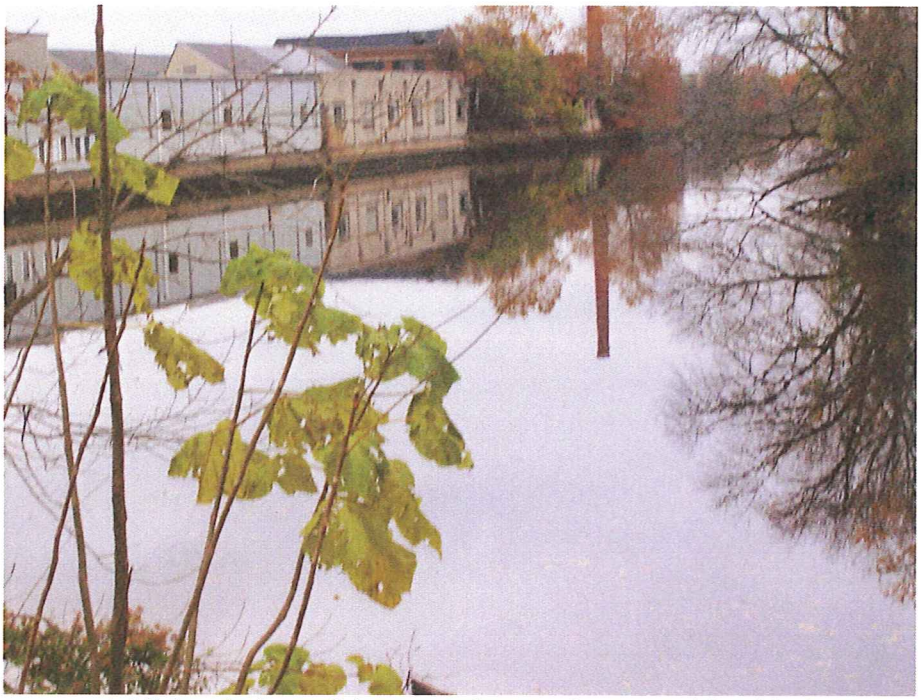
PCB Mass Loading Evaluation
Electric Hose and Rubber



View of additional area of concern associated with Electric Hose and Rubber that is adjacent to river.



Additional view of the second area of concern identified.

PCB Mass Loading
Electric Hose and Rubber
SIRB ID: DE-0174
Wilmington, Delaware

BrightFields, Inc.

Overland Flow Calculations

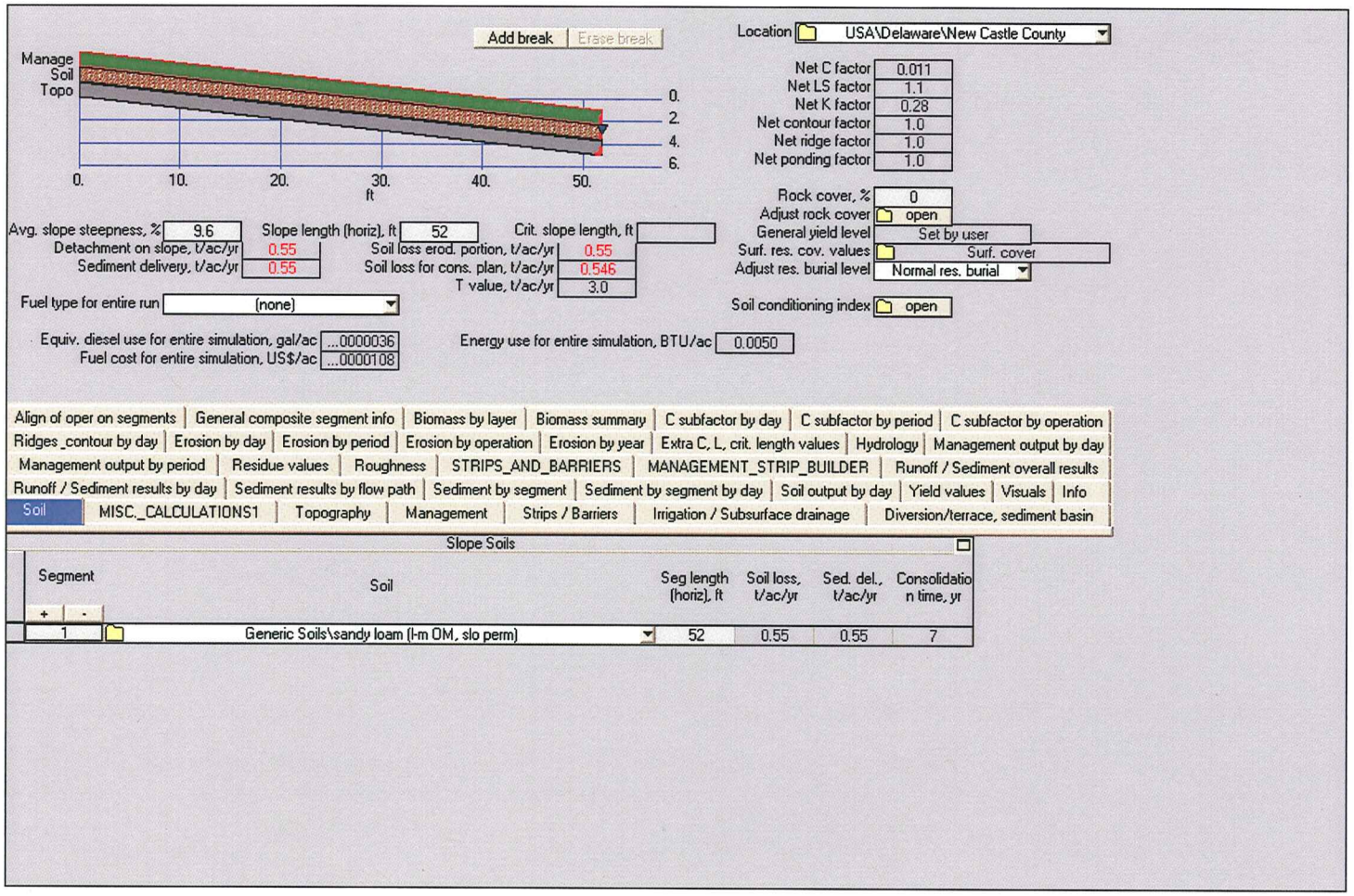
PCB Loading Calculations from the Universal Soil Loss Equation
Electric Hose and Rubber (Area 1)
Wilmington, DE
DE-0174

Surface PCB Concentration | 1970 | mg/kg

Symbol	Factor	Value	Units
R	Rainfall/Runoff Erosivity Index	170	10^2 ft-tonf in/acre hr
K	Soil Erodibility	0.15	0.01 tonf acre hr/ac ft-ton in
	Estimated Slope Length	102	Feet
	Estimated Elevation Difference	0.01	Feet
	Slope	0.01	Percent
	Erodeable Area	0.04	Acres
LS	Topographic Factor	0.031	Dimensionless
C	Cover and Management Factor	0.08	Dimensionless
P	Support Practice Factor	1	Dimensionless
	Average Annual Soil Loss	0.03	ton/ac/yr

PCB Loading via Overland Flow | 1.8 | **grams/year - PCBs**

Electric Hose and Rubber (Area 1)



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July 2009

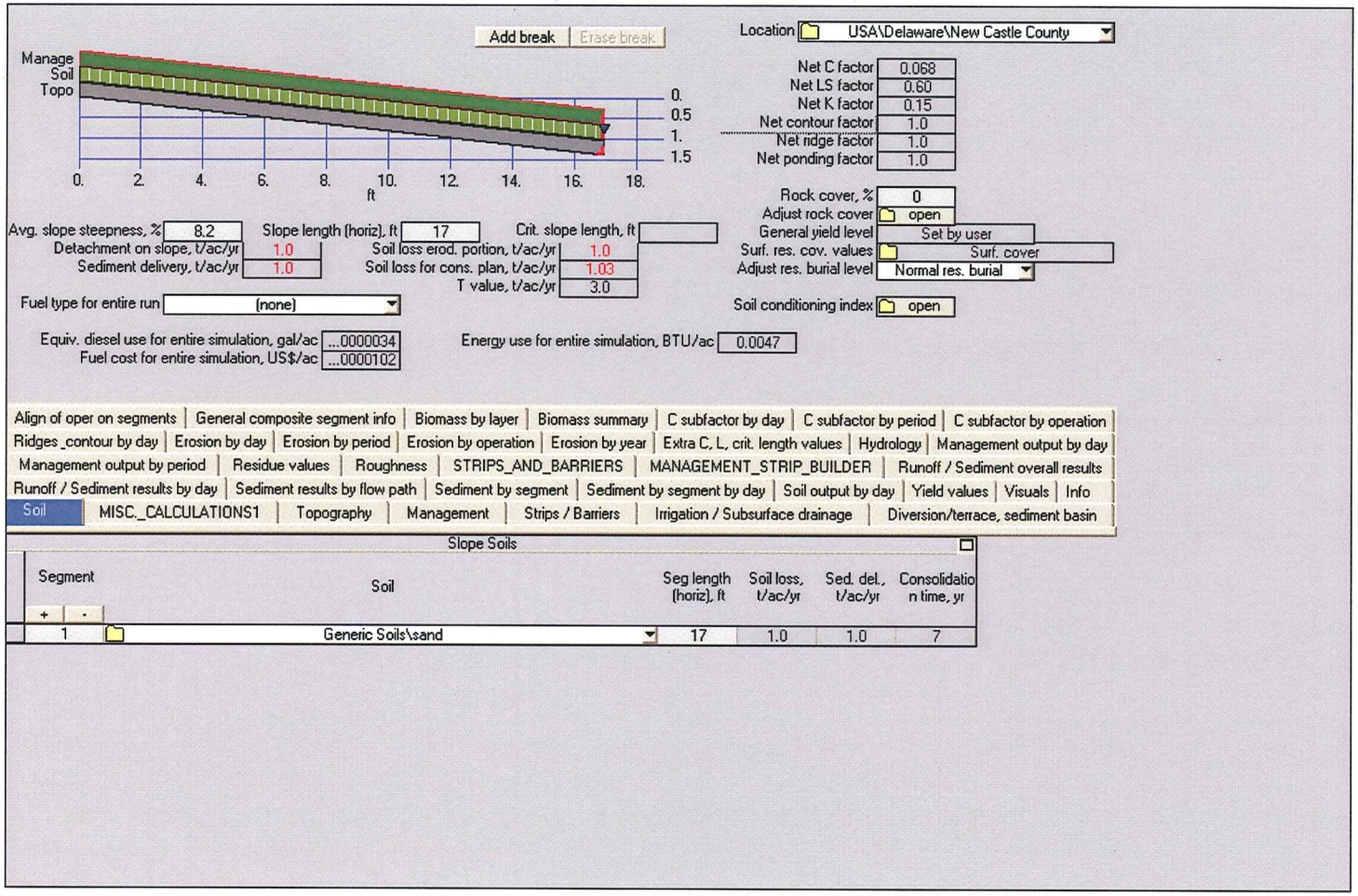
PCB Loading Calculations from the Universal Soil Loss Equation
Electric Hose and Rubber (Area 2)
Wilmington, DE
DE-0174

Surface PCB Concentration | 2.4 | mg/kg

Symbol	Factor	Value	Units
R	Rainfall/Runoff Erosivity Index	170	10^2 ft-tonf in/acre hr
K	Soil Erodibility	0.15	0.01 tonf acre hr/ac ft-ton in
	Estimated Slope Length	17	Feet
	Estimated Elevation Difference	1.4	Feet
	Slope	8.24	Percent
	Erodeable Area	0.02	Acres
LS	Topographic Factor	1.000	Dimensionless
C	Cover and Management Factor	0.068	Dimensionless
P	Support Practice Factor	1	Dimensionless
	Average Annual Soil Loss	1.00	ton/ac/yr

PCB Loading via Overland Flow | 0.044 | **grams/year - PCBs**

Electric Hose and Rubber (Area 2)



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July 2009